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Managing Configuration of Ground Software Applications With Glueware

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ABSTRACT:

Managing the specification of input data in the uplink subsystem has always been nontrivial—multiple applications must use a correct and consistent file set that changes as sequence development progresses in time. It is, however, important since misconfiguration introduces risk and requires rework. The distributed operations environment of the Cassini-Huygens project provides additional challenge with remote users and remote machines, multiple system architectures, and fewer specialized operators. Because the lower cost paradigm for mission operations was instituted after the mission concept was in place, addressing this complexity in the ground system has been problematic. The operations team thus faces the conundrum of having neither the resources for business as usual nor any significant funding for simplification.

This paper reports on a simple, low-cost effort to streamline the configuration of the uplink software tools. Even though the existing ground system was JPL and custom Cassini software rather than COTS, we chose a glueware approach— reintegrating with

wrappers and bridges and adding minimal new functionality. Highlights of the restructured system include the following: (a) an electronic version of the master list of correct ancillary files updated at each stage of sequence development, (b) a script validating the master ancillary list construction and verifying that named files exist, (c) a translator to make a web page reference from the master list, (d) a new tool which enables single point construction of sequence specific configuration files for each application from the master list of correct files, (e) alterations to the configuration files themselves and to already existing application wrappers so that those sequence specific specifications can be used, (f) a configuration file naming convention that allows easy recognition of the appropriate configuration file for the work at hand, (g) expansion of the project database to include the master ancillary file lists and the configuration files, (h) a logical file structure that provides the application programs a single view of the ancillary files while allowing different implementations in various subsystem architectures, and (i) active maintenance of the ancillary input files within the ground system in a manner expected by the applications.

Available resources for development demanded a solution that was inexpensive and evolutionary. By rethinking procedures, making modest changes to existing components of the ground system, and adding glueware, the configuration of uplink software applications was simplified and made more consistent. Cost savings result from eliminating redundant effort, increasing efficiency with simple automation, reducing risk, and saving disk space and bandwidth.